Report of

Actuarial Investigation

April 1, 1945

PUBLIC EMPLOYEES' RETIREMENT FUND

TEACHERS' RETIREMENT FUND

HIGHWAY PATROLMENS' RETIREMENT FUND

Prepared by

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FILE COPY

Honorable Theodore G. Driscoll,
Commissioner of Administration
Department of Administration
State Capitol
St. Paul, Minnesota

Dear Mr. Driscoll:

At a conference held in your office in September, 1943, I agreed to make a study of the Public Employees' Retirement Fund, the Teachers' Retirement Fund, and the Highway Patrolmens' Retirement Fund, and submit a report showing the financial conditions of the funds and such conclusions and comments as might be found appropriate.

With the cooperation of the secretaries of the three funds we obtained detailed information on the membership and the financial status of each of the funds and have made extensive statistical studies from the data obtained as to distribution of membership, both active and retired, rates of turn-over of employment, withdrawal from service and mortality, studies of the provisions of the governing statute with amendments thereto, and the present financial status of the funds in relation to the benefits promised, taking into account the provisions for financing such benefits.

A report in detail of each of the funds follows.

Edward D. Brown, Jr. Actuary

PUBLIC EMPLOYEES RETIREMENT ASSOCIATION

The Public Employees Retirement Association was established April 24, 1931 under the provisions of Chapter 307-Laws of 1931. The original act was amended by Chapter 374-Laws of 1933; Chapter 106-Laws of 1935; Chapter 466-Laws of 1937; Chapter 285-Laws of 1941; and Chapter 167-Laws of 1943. The governing statute is known as Chapter 353 of the Minnesota Statutes, 1941. The principal provisions of the governing act are as follows:

MEMBERSHIP

Membership in the Association is limited to public employees and employees of the Association. Public employee is defined as any person holding a position by election, appointment, or contract in a governmental sub-division, to which provisions of the act apply, whose salary is paid in whole or in part through taxation, fees, assessments or revenue of such sub-divisions except, (1) a temporary employee, (2) an employee who, by virtue of former employment in public service, is the beneficiary of, a contributor to, who has an unrealized interest in, or is a future beneficiary of any pension, relief, or retirement fund established under the law of the state or, (3) any employee who by virtue of present employment is required to contribute to, or is eligible for membership in, or to be designated as a future beneficiary of any retirement, relief, or pension system established under existing law.

"Present employee" means a public employee in service on the date of acceptance of the terms of the act by the governmental sub-division by whom employed. "New employee" means a public employee employed subsequent to the date of acceptance of the terms of the act by the governmental sub-division by whom employed.

Membership is optional to present employees, but is made a condition of employment for new employees. Present employees, subject to certain specific requirements, may exercise the option to become members within two years of the date of acceptance of the terms of the act by the governmental sub-division by whom employed upon payment of a membership fee of $10.00, and the accrued salary deductions since the date of acceptance of the terms of the act with interest compounded at the rate of 5% per annum. After two years from the date of acceptance of the terms of the act, a present employee may join the Association by making the same required payments, and in addition 5% of the total amount otherwise payable, excluding the membership fee, and an additional 5% of such total for each full year in excess of two years after the date of acceptance before the option is exercised. Similar rules are in effect covering the rights of elective officials to membership in the Association.

MANAGEMENT

The management of the Association is vested in a Board of Directors, consisting of nine members, which is known as the Public Employees Retirement Board. The state auditor,

the state insurance commissioner, and the state treasurer are ex-officio members of the Board and there are six public employee members elected by the members of the Association. Elective members hold office for a term of three years. The Board elects a Chairman, and appoints a Secretary, and may hire such other employees as are necessary and fix their compensation. Board members serve without pay, but are reinbursed for expenses incurred in the carrying out of their duties. The Board may establish such rules and regulations as are necessary for the administration of the provisions of the act, subject to any specific limitations contained therein. The state treasurer is ex-officio the treasurer of the Retirement Fund. The State Board of Investments is authorized to invest the funds of the Association in securities which are authorized as legal investments for savings banks and trust companies. The attorney general is the legal advisor of the Association and the Retirement Board.

CONTRIBUTIONS

All members have been required, since the organization of the Association, to contribute 3½% of salary to the Retirement Fund, which amounts are credited to the accumulated deductions of the member. Since July 1, 1945 each member is required to make an additional contribution of one-half per cent of salary, which additional amount is credited to the accumulated deductions of the member until such member is eligible for non-employee membership. After such eligibility has been attained, such additional payments are irretrievable by the member, upon withdrawal from service, or by the beneficiary

of the member in the event of death. The additional one-half per cent of salary is also required of non-employee members, or an additional one-seventh of the assessment paid in lieu of salary deductions.

In case the salary is reduced, the employee may elect to continue deductions on the basis of the last salary received before the reduction took place, and thereby be entitled to the same annuity as if there had been no reduction in salary.

All contributions of active employees are made by deductions from salary. Statements of such deductions are furnished by department heads, and remittances made to the state treasurer for the benefit of the Retirement Fund. All such salary deductions are paid into a Fund known as the Retirement Fund, and all interest earned and all other income of the Association is paid into this Fund. The Retirement Fund shall be disbursed only for the purposes of the governing act. Expenses of operation and all annuities shall be paid only from said fund.

Upon acceptance of the provisions of the act by a governmental sub-division, the head of the department or administrative officer of such governmental sub-division must submit a statement showing the name, age, sex, title, compensation, and length of service of each employee; and monthly thereafter must submit a statement showing the list of new employees entering service and of all removals or withdrawals from service and changes of salary within the preceding month.

No contribution shall be made to the Retirement Association by any governmental sub-division affected by the provisions of this act unless the governing body of any such governmental sub-division shall cause the retirement of any public employee solely by reason of having attained any fixed age. In the event that any such governmental sub-division shall adopt compulsory retirement ages for public employees, then such governmental sub-division shall assume the liability to pay one-half the cost of all annuities thereafter granted by the Retirement Board to any public employee affected by such compulsory retirement. The total amount of such share of such annuities shall be determined by the Retirement Board and certified to any such governmental sub-division annually before September 30th covering the twelve-month period ending on the preceding June 30th. The amount so certified shall be included in the next budget and shall be levied and collected and transmitted to the Retirement Fund.

TERMINATION OF MEMBERSHIP

After termination of employment in a governmental subdivision, the member upon demand shall be paid the full amount of accumulated deductions to his credit. If such member is credited with ten or more years of service, of which four or more years shall be contributing service, the member may elect to become a non-employee member and continue the rights of membership upon payment of monthly assessment in lieu of salary deductions. The assessment shall be determined on the basis of

the average deduction from salary while an active employee. A non-employee may terminate such membership upon proper notice, and receive on demand the full amount to his credit as accumulated deductions.

REINSTATEMENT

An employee who has left service and has withdrawn his accumulated deductions, if re-employed in public service within five years, shall have the annuity rights forfeited by the withdrawal of accumulated deductions restored upon repayment of such withdrawal with 5% interest compounded from the date of withdrawal to the date of repayment, together with an amount equal to the deductions which would have been made during the period the member was out of service, if membership had been retained, with 5% compounded annually. If the amount withdrawn is not repaid, the member must make contributions for a period equivalent to that originally required to qualify for a retirement annuity when he first became a member before any retirement will be granted.

RETIREMENT

Any member of the Association who has been a public employee for a period of 20 years and has attained the age of 65 years, or who has been a public employee for a period of 35 years and attained the age of 60 years, shall be eligible for retirement provided that in computing such time of service the time during which any member shall have maintained membership

as a non-employee member shall be included. Upon application of the member who has become eligible for retirement, such member shall be granted an annuity for life equal to 50% of the average annual salary received for the entire period of membership in the Association. In computing the average annual salary for members who have contributed assessments in lieu of salary reductions, the average annual salary received while such a member was employed in the public service as a member of the Association shall be considered the salary of the member for that period during which contributions were made by assessment. In computing the period of past service, employment by any governmental sub-division shall be counted regardless of whether or not such governmental sub-division has accepted the provisions of the act. No such annuity shall in any event exceed the sum of $1,800 per year.

Membership for any present public employee shall begin on the date of acceptance of the application for membership and in no case shall the Retirement Board grant any pro rata annuity until four full years of membership have elapsed, nor shall the Board grant any pro rata annuity based on a greater number of years of contributions than then stand to the credit of such member, or any full retirement annuity until and unless five full years of membership have elapsed. All annuities granted under the provisions of this act shall begin on the first day of the month next succeeding termination of public service for retirement and paid monthly thereafter during the lifetime of the annuitant, and shall not be increased, decreased, or revoked except as provided in the act.

DEATH BENEFITS

In the event of a death of a member of the Association there shall be paid in one sum the total amount of the accumulated deductions to his credit, and such additional accumulated deductions as may have been paid into the Fund under the provisions of the act, exclusive of any payment representing accrued interest, and less such annuity payments as have been paid to such member, to the beneficiary designated by the member, or if none, to the legal representative of such member upon establishment of a valid claim. If no valid claim is established the accumulated deductions shall remain with and become the property of the Association.

DATE OF RETIREMENT -- ADDITIONAL CONTRIBUTIONS

No retirement annuities could be granted under the act before July 1, 1935. No member of the Association can become eligible for an annuity until he shall have contributed to the Fund for a period of four full years and unless he shall have been a member for a like period.

Any member who has fulfilled the above conditions and has attained the age of 65 years and has contributed to the Fund for a period of less than 20 years shall be entitled to a pro rata retirement annuity in an amount bearing the same ratio to the full retirement annuity that the period of salary deductions or assessments in lieu thereof bears to 20 years. When any such member shall have become eligible to receive such pro rata annuity and shall have contributed to the

Retirement Fund for five full years and shall have been a member for a like period, such member may elect to apply for a full retirement annuity or for pro rata retirement annuity based on a greater number of years of contribution than stand to his credit. Such an annuity shall be granted under the following conditions.

If the member applies for a full retirement annuity, the Board shall determine the number of years of contribution required to make a total of twenty years of contributions by the member and the average annual amount of accumulated deductions of such member for the period of his membership in the Association. The Board shall also determine the amount of additional accumulated deductions required by multiplying the number of years of additional contributions required by the average annual amount of accumulated deductions. The member is required to pay into the Retirement Fund the total amount of such additional accumulated deductions, and in addition a further amount representing an accrued interest payment determined as a specific percentage of the total additional contributions, which percentage is determined by the number of years for which such contributions are required.

If the member applies for a pro rata annuity based on a greater number of years of contribution than stand to his credit, the Board shall determine the amount of the additional accumulated deductions required, and shall require that the member pay into the Retirement Fund such additional amount and in addition thereto, a further amount representing accrued

interest payments determined as a percentage of the additional amount required, which percentage is based upon the number of years of additional credit applied for.

MINIMUM REQUIREMENTS

The minimum requirement for a retirement annuity for a member who has attained the age of 65 years, shall be 20 years of contributions to the Fund, or its equivalent, with an amount representing accrued interest earings as set forth in the preceding paragraph. Where a member applies for retirement at an age earlier than 65 years but not earlier than 60 years, the minimum requirement as to the years of contribution shall be twenty years, increased by one year for each year that the applicant is under the age of 65 years except that any member who shall have reached the age of 60 years on May 1, 1937 and who, prior to June 1, 1936, left public service and maintained membership by payment of assessments, the minimum requirement for full retirement annuity shall be twenty years regardless of attained age at the time of such retirement. No full retirement annuity or pro rata retirement annuity based on a greater number of years of contribution than the number of years he shall have been a member of the Association, shall be granted to any member who has not attained the age of 60 years.

PROPORTIONATE REDUCTION OF ANNUITIES

The total amount available for annuity payments during any month shall in no case exceed the total amount received

from salary deductions and assessments during the preceding month, and should the total of annuities in force exceed such amount it shall be the duty of the Retirement Board to reduce proportionately all annuities payable. Any such reduction shall be paid proportionately during the first and subsequent months when such salary deductions and assessments exceed the total of all annuities then payable.

APPLICATION OF ACT

The provisions of this act shall not apply to any governmental sub-division until the governing body of such governmental sub-division shall have duly approved, by a majority vote, and a resolution in writing, of salary deductions as provided in this act, and filed a certified copy of such resolution with the proper officials of the governmental sub-division and with the secretary of the Retirement Board.

MISCELLANEOUS PROVISIONS

None of the moneys, annuities, or other benefits of the Retirement Fund shall be assignable or subject to legal process, nor be subject to state income tax. The laws of the state regulating insurance shall not apply to the Retirement Fund. The books and accounts of the Association shall be examined and audited annually by the public examiner and a report thereon made to the Retirement Board without expense to the Retirement Fund. The Retirement Board is empowered and authorized to receive contributions, donations, and bequests. Any member who shall fail to demand the amount of his accumulated deductions

within five years after separation from service, and who shall not have retained membership in the Association, shall be deemed to have donated the amount to the Retirement Fund. The Board has the power to issue rules and regulations covering all administrative matters not specifically provided for, and the Board has the final power to determine the status of any individual for the purpose of this act. Penalties are provided for any person giving false information or who shall willfully refuse to perform any duty prescribed by this act.

ADVANCE ANNUITY PAYMENTS

By rule of the Board any member who may be entitled to receive an annuity before he shall have contributed to the Fund for such a period as will entitle him to receive a full annuity, shall have the privilege to elect to make advance payments into the Fund in the Sum of $50.00 or multiples thereof; such advance payments to be credited and applied on any amount due from such member on any application for annuity which he may make at a later date. Such payments shall be credited to the account of the member and designated as advance annuity payments. When such member makes application for annuity, the amount of such advance annuity payments, together with interest at a rate to be determined by the Board, shall be credited against the amount required under any such application, but if such advance annuity payments exceed the amount required the excess shall be refunded. Advance annuity payments shall be subject to withdrawal only upon the death or withdrawal of such member from the Association.

SCOPE OF INVESTIGATION

In this investigation we have attempted to set out the facts with regard to the governing statute, the experience of the Association as regards its membership, its financial experience, its present status, and some estimates as to future prospects.

DATA OBTAINED

With the assistance and cooperation of the secretary and the office staff, the following data was collected on the membership of the Association: For each active member;

Sex
Date of Birth
Years of Service Credit
Amount of Accumulated Deductions

For each retired member;

Sex
Date of Birth
Date of Annuity
Amount of Accumulated Deductions
Amount of Annuity
Years of Service Credit

Similar data was obtained for retired members who have died. Punch cards were prepared from the data sheets and numerous tabulations were made from these cards. Exhaustive studied were made to reveal the present status of the Fund, and various projections were made into the future to estimate the future course of its experience. This data was obtained as of October 1, 1943 and reference herein to present status relates to that date.

MEMBERSHIP

The data furnished shows a total 7,372 members, of which 7,176 are active members, including 174 non-employee members, and 196 members retired drawing annuities. A distribution of the membership by age and sex is as follows:

ACTIVE MEMBERS

AGE	MEN		WOMEN		TOTAL	
	Number	Accumulated Deductions	Number	Accumulated Deductions	Number	Accumulated Deductions
18-22	88	$ 1,562	435	$ 12,426	523	$ 13,988
23-27	165	14,222	434	33,406	599	47,628
28-32	332	52,883	403	57,991	735	110,874
33-37	409	103,524	360	70,021	769	173,545
38-42	484	153,370	264	59,753	748	213,123
43-47	615	243,071	318	89,989	933	333,060
48-52	682	311,949	239	68,750	921	380,699
53-57	601	279,796	203	64,113	804	343,909
58-62	458	227,181	110	42,202	568	269,383
63-67	282	144,900	58	24,790	340	169,690
68-72	145	81,920	18	10,378	163	92,298
73-77	52	35,775	5	3,484	57	39,259
78-82	12	10,304			12	10,304
83-87	3	2,983			3	2,983
88-92	1	739			1	739
Total	4,329	$1,664,179	2,847	$537,303	7,176	$2,201,482

RETIRED MEMBERS

AGE	MEN		WOMEN		TOTAL	
	Number	Annual Annuity	Number	Annual Annuity	Number	Annual Annuity
53-57	1	$ 579		$	1	$ 579
58-62	3	3,931	1	781	4	4,712
63-67	28	26,491	9	6,718	37	33,209
68-72	54	53,852	14	10,349	68	64,201
73-77	42	39,596	9	8,109	51	47,705
78-82	21	16,956	4	2,617	25	19,573
83-87	8	7,871	1	810	9	8,681
88-92	1	1,699			1	1,699
Total	158	$150,975	38	$29,384	196	$180,359

Total Membership, Active and Retired, 7,372

As of June 30, 1943 there were 104 governmental units which had accepted the provisions of the Retirement act, distributed as follows: 61 counties, 25 cities, and 18 school districts.

Since the inception of the Retirement System, the number of governmental units and total membership has shown a steady increase. The number and amount of annuities paid have also shown steady increases since the first annuities were granted in 1935. The average number of new and reinstated members per year has been 1,186.

There has been a very rapid turn-over of membership, particularly in the last three years. Out of 13,377 new entrants and 788 reinstatements between July 1, 1931 and June 30, 1943, 6,911 have withdrawn from service and 404 have died, making a total turn-over rate during this particular period of 51.6%.

The present active members of the Association have to their credit accumulated deductions of $2,201,482. Retired members now drawing annuities have dontributed $256,491 in accumulated deductions and $72,010 in amounts representing interest; a total of $328,501.

53 annuitants with annuities totaling $45,261 annually have died. These annuitants had contributed $63,411 in accumulated deductions, and $21,036 in amounts representing interest; a total of $84,447. Annuity payments to these annuitants totaled $130,500.

FINANCIAL HISTORY

The principal sources of income from the Fund have been members' deposits, fees, and interest on investments. The total received from members up to June 30, 1943, including members' deposits, fees and penalties, and advance annuity payments amounted to $3,112,979. Interest received, including interest on bonds and back payments of members, totaled $552,641. Total receipts, exclusive of bonds called and matured, total $3,842,803.

Disbursements, excluding bond purchases, have been made principally for refunds to withdrawing members, annuity payments, and expenses of operation. Refunds to members have totaled $731,164, annuity payments $665,397, and operating expenses $71,498.

Assets of the Retirement Fund at June 30, 1943 amounted to $2,246,195 consisting principally of cash, $83,822; and

bonds, $2,123,932.

Liabilities shown by the financial statement of the Association at June 30, 1943 amounted to $2,162,088, consisting chiefly of members' deposits and advance annuity payments totaling $2,157,562. The difference between assets and liabilities of $84,107 is shown in the financial statement as a surplus. No liability is set up for future payment of annuities to retired members except $38,016 representing the accumulated deductions of retired members not yet disbursed in annuity payments.

Income from investments has increased in amount each year of operation, but the rate of yield has decreased in each year. The yield was in excess of 3½% up to 1938, decreasing to 3% in 1941, 2.9% in 1942, and 2.8% in 1943. This follows the general trend of experience of financial institutions.

Expenses of operation have been modest and compare favorably with the expenses of comparable retirement funds. The expense has averaged $1.207 per member per year, or about 10¢ per month.

Annuity payments are charged against the accumulated deductions of retired members until the member's account is used up, and thereafter against income. Since no annuities were granted before 1935, income from investments, fees, and other miscellaneous sources exceeded expenses of operation and annuity payments from income up to 1940. The excess of income increased each year to 1937, reaching a high for that year of $42,593.76. At June 30, 1940, the accumulated excess

amounted to $156,518.66. Since 1940, income has been less than expenses and annuity payments in each year, reducing the accumulated excess at June 30, 1943 to $84,106.62. The deficiency for the year ended June 30, 1943 was $36,272.96.

ADEQUACY OF PLAN

The basic plan of operation of the Retirement Fund is, in a simple statement, contributions by members at a prescribed rate, and benefits of specified amounts to members who retire under certain conditions of eligibility. In order for the plan to be adequate, the funds derived from contributions and earnings thereon must be sufficient to provide the promised benefits. Theoretically, and from the standpoint of equity, each member's contribution with interest earned thereon before retirement, plus the member's share of any additional contributions or forfeitures available for the entire group, should be a sufficient amount to make all payments of the members' annuities when they fall due. Actually, in practice, it is necessary that the aggregate of the funds be sufficient to make all annuity payments.

In order to measure the adequacy of the Retirement Fund on the basis of its experience, we have made a valuation of the liability and future payments of annuities to existing retired members. This valuation was made on the basis of the Combined Annuitants Mortality Table and interest at 3%. This basis we believe fairly represents the measure of what may be expected over a considerable period in the future. Results of

this valuation show a liability for the 158 men with annuities of $150,975 annually, of $1,140,428; and for the 38 women with annuities of $29,384 annually, of $267,131; or a total liability of $1,407,560. This is the amount which the Fund should have on hand on the basis of computation used in order to make all future annuity payments to these annuitants as they fall due. The Fund, in its financial statement, shows a liability of $38,016 for this purpose.

As a measure of the adequacy of the contributions, these annuitants contributed a total of $328,501 to the Fund, or enough to pay their annuities totaling $180,359 annually for 1.82 years. Annuitants who have died contributed a total of $84,487, or enough to pay their annuities totaling $45,261 annually for 1.87 years. Actually, they received payments totaling $130,500, or $46,053 more than the total of their contributions. These deceased annuitants can not represent the average as many who were granted annuities at the same time are still drawing annuities and will continue to do so for years to come.

These figures of contributions made by annuitants do not include any portion of the interest earned throughout their active service either on their contributions or on the contributions of members who withdraw from service. Even if the total amount of earnings over the entire history of the Fund had been apportioned solely to these annuities, this amount of $552,641 would have paid the excess of annuity payments over contributions to the annuitants who died, and the annuities of living annuitants for less than three years.

From another view, the only source of funds to provide benefits is the contributions made by members who remain in service to retirement, plus interest earned thereon, plus interest earnings of contributors who withdraw or die, plus forfeitures on the extra one-half per cent contributions made by those who withdraw or die, plus any amounts received from other sources. We have made computations, based on the experience of the System in the period 1931-1943 as to withdrawals and deaths, the Combined Annuitants Mortality Table, and 3% interest earnings, of the accumulation of funds for members who continue in service to retirement, assuming a continuous salary of $2,000 per year throughout service and a contribution of 4% of salary each year, and compared the resulting amounts with the amounts necessary to provide annuities promised at retirement. Results of these computations are as follows:

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Annual Salary $2,000 Annual Deposit $80.00

Annuity at Retirement, $1,000

Years of Contribution	Accumulated Amount
20	$ 2,369.25
25	3,215.76
30	4,198.12
35	5,340.04
40	6,674.67

Amount Required for $1,000 Annuity

Retirement Age	Men	Women
60	$ 11,870.10	$ 13,404.80
65	9,992.20	11,489.40
70	8,211.00	9,626.50

It is obvious from a comparison of accumulated amounts with the amounts required to produce the expected annuity, that the accumulated contributions are inadequate, even at the longest period of contribution and the oldest age at retirement. The accumulation for a reasonable period of 35 years when applied at a reasonably normal age at retirement of 65 will produce more than one-half the expected annuity for a man, and less than one-half for a woman.

These figures apply only when the member has contributed at the full rate throughout the entire period of service. They can not be applied to present active members as no contributions are required for service prior to 1931, and contributions were at a rate of 3½% until 1943. The additional amounts contributed under the provisions of the act by retiring members who are required to contribute such amounts representing interest accruals would increase the total amount available for purchase of the annuity, but are obviously insufficient to make up the deficiency.

The liabilities set up by the Retirement Fund not only do not include the liability for future payments to members already retired, but do not provide for the accumulated deficiencies in contributions of present active members; or to state it in another way, the contingent liability for future payments of annuities to present active members. It is obvious from the preceding discussion, that such a liability exists. We have not attempted to make an accurate determination of this liability, but estimate it roughly at $4,350,000. This estimate

was based on the deficiencies which we may reasonably expect from the accumulation from members' deposits and the experience of the Association as to withdrawals from service, death, and retirement.

The conclusion is inescapable that the Fund as presently constituted is inadequate to provide the benefits promised because the basis of contributions to provide funds for the Association is obviously inadequate.

FUTURE PROSPECTS

In order to arrive at an estimate of the amounts which the Fund will be called upon to disburse in annuity payments in future years, we have made a projection of the present membership, both active and retired, based on the experience of the Association as to withdrawals and retirement on annuity, and the Combined Annuitants Mortality Table. This projection has been made in five-year periods over a period of twenty-five years. It can not be expected that this projection will measure accurately the exact amount of annuity payments in each of the years shown as there are many factors which will influence the amount of these payments which can not be accurately predicted. We believe, however, that these calculations represent, to a fair degree, the expected trend of annuity payments, and within reasonable limits the actual amounts which can be anticipated. Results of this projection are as follows:

ANNUAL ANNUITY PAYMENTS

Year	Men		Women		Total	
	No.	Amt.	No.	Amt.	No.	Amt.
1943	158	$150,975	38	$29,834	196	$180,809
1948	399	400,815	96	75,884	495	476,699
1953	505	507,744	158	124,346	663	632,090
1958	576	579,079	227	178,821	803	757,900
1963	595	598,378	290	229,069	885	827,447
1968	548	552,806	326	258,068	874	810,874

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You will note that this projection forecasts a substantial increase in the amount of annuity payments over the next 20 years for men, and a slight decrease within the next 5 years. For women, the increase is continuous. This difference is due to the fact that by far the larger concentration of women is at the younger ages who will not be eligible for annuities for a considerable time; whereas, the men are concentrated largely between ages 40 and 60, who will consequently be eligible for annuities earlier than the women. This projection does not take into account any new entrants into the System, but covers only present active and retired members. The influx of new members in the future will, of course, produce additional annuity payments beginning about 25 years hence. We believe it reasonable to expect, therefore, that the level of annuity payments will rise rather steadily for the next 20 to 25 years, and about that period will reach a level in excess of $800,000 annually, and remain constant at or about that level indefinitely thereafter, on the assumption that the number of members, and their age distribution will remain approximately

the same as at present. It is obvious that the funds now held by the Association, together with revenues which can be anticipated on the present basis of contributions, will not be sufficient to meet the requirement for annuity payments as this requirement increases.

CONCLUSIONS

The first conclusion to be drawn from this investigation is that the Retirement Fund is actuarially insolvent. This conclusion is inescapable in view of the fact that the assets of the Association, as of June 30, 1943, were about $1,300,000 less than the amount necessary to cover members' deposits which are subject to withdrawal, and the liability for future payments of annuities to those already retired, and in addition make no provision for the estimated $4,350,000 contingent liability for deficiencies of contributions of present active members.

The provisions for contributions by members of the Association are inadequate as has been clearly demonstrated. No provision is made in the law for contribution by the governmental sub-divisions, by which members are employed, and if this position is to be continued, it is obvious that either members' contributions must be substantially increased, or the level of benefits substantially lowered.

The practice generally of public employee retirement systems is to provide for a joint contributory basis, calling for contributions from the employee and the employer. Normally,

the employee contributes a percentage of salary, and the employer contributes amounts which in effect match the contributions of the employee, or make up the balance of the retirement allowance not provided for by the members' contribution. Where credit is allowed for service rendered prior to the organization of the Retirement System, liability for benefits granted for such service is, in most cases, made a liability of the employer. The members themselves are not able to finance the cost of benefits from prior service, and the only logical conclusion is that the employer should finance such benefits if they are to be granted.

The only provision in the law which would make up the deficiencies in contributions is the provision for reduction of annuities where the amount of annuity payments exceeds the amount of contributions. This is a very undesirable provision as it offers no security to the retired member, and no guarantee that his annuity will be continued to him at the same level after he has retired from service. Under the present method of financing, however, there is only one alternative, which would be a provision that any deficiencies in the amount available for annuity payments should be made up by additional contribution by active members. Such a provision is obviously unfair as the active members would be required to contribute additional amounts from which they could never expect to receive any benefit.

The provisions for service credit appear reasonable and fair and generally in agreement with the practice among retirement systems. The provision for allowing a former employee,

upon return to service, to repay amounts refunded on previous termination of annuity rights, is a provision used by many retirement systems but is some cases is not permitted. The chief difficulty with such a provision is that the returning employee often finds it very difficult, if not impossible, to repay the amount withdrawn.

The provision for refund of contributions on termination of service, is a common provision and one which has often been abused. Basically, the deposits made by members are for the purpose of providing a portion of the allowance provided at retirement. Some funds have taken the view that since such deposits are made for this purpose, they shall be used for no other purpose and therefore do not permit withdrawal of funds upon separation from service. The amounts deposited and the retirement rights acquired are continued for the benefit of the former employee, and a partial or proportionate benefit is granted when he reaches retirement age.

The provision for payment of accumulations to heirs or legal representatives at the death of the member is in accord with general practice.

The provision for annuities on retirement is not entirely satisfactory from the standpoint of equity. A member with 20 years of service, who has reached 65, would get exactly the same annuity where the average salary is the same as another employee with 45 years of service and retiring at age 65, although he had contributed to the Fund for 25 years longer. Furthermore, there is no recognition of the difference in value

of annuities granted at different ages which would make an annuity of the same amount have a considerably higher value; for instance, at age 60 than where retirement took place at age 70. From the standpoint of a reasonably adequate retirement allowance, however, the amounts provided are reasonably satisfactory.

The provision for an annual examination and audit by the public examiner is desirable as an independent check on the accounting transactions of the Fund. Such an examination, however, does not contemplate or attempt a check on the financial position of the Fund, taking into account all existing liabilities, both actual and contingent, or the adequacy of rates of contribution to provide promised benefits. Such information can be obtained only by an actuarial examination. There should be a requirement for an annual valuation of liabilities, on a basis approved by the Board, which should be made a part of the annual financial report. If such a provision had been included originally, the actuary making the valuations would have pointed out the deficiencies and inadequacies of the System, and corrective measures could have been taken before the situation reached its present stage.

We conclude, therefore, that in general the provisions under which the Retirement System operates are not unreasonable with regard to membership, service credit, refunds, and annuities, although some change may be indicated to improve these provisions in certain respects. It is obvious that the provisions for financing the system are inadequate, that the operation of the system has resulted in a substantial deficit, and if the system

attempts to continue on the present basis of operation the results will be an increased deficit, reduction of annuities by retired members with no hope of restoration to their original amount, and an eventual abandonment of operation of the System.

It appears imperative that steps be taken immediately to correct the inadequacies of the System as it now exists. We do not believe it feasible to increase the contribution of employees to a level which would be adequate to provide the benefits now promised, nor do we favor reducing the benefits to the extent which would be necessary to make the present contributions adequate, as the resulting retirement allowance would be inadequate for the purpose for which the System was organized--that of furnishing reasonably adequate retirement benefits to members who are no longer able to continue efficiently in their positions. It appears advisable to make provisions for regular contributions by the governmental sub-divisions, or the state, or both, which will provide sufficient amounts to finance the portion of benefits not provided by the contributions of members; and that there should be included a provision which makes the responsibility for maintaining the adequacy of the System an obligation of the governmental sub-divisions, or the state, or both. This conclusion is obvious when we consider that any deficiencies which arise may be made up from only three sources; (1) from retired members by reduction of their annuities, (2) from active members by additional contributions, or (3) by the employer. The first of these is obviously undesirable as it reduces the income of the retired member, which he has been

lead to expect will continue at the level on which it was granted, and which is none too adequate at best, at a time when he is unable to supplement his income by his own effort. The second alternative is also unsound as it provides for contributions from which the member can never expect to receive any benefit. It seems clear, therefore, that the responsibility, if any, should be an obligation of the employer. We believe that the contribution by the employer should be calculated, and paid over into the Fund currently with active service on the basis which will provide the entire amount necessary at retirement to pay the annuity based on current service, and that additional contributions should be made which will liquidate the employer's contingent liability for prior service over a period not to exceed 50 years. As an alternative, employers' contributions may be made in the year of retirement, sufficient to provide all the annuities granted in the current year. From the standpoint of the taxpayer, however, the previous method is ultimately less costly.

Provisions for benefits granted should be revised to provide a benefit based on the employee's contribution of the amount which the accumulation of members' deposits will purchase at retirement. Interest should be credited to members' deposits currently as earned by the invested funds of the Association, and the full accumulation should be applied to the purchase of an annuity. The benefit provided by the employer should either match the amount provided by members' deposits, plus an additional amount for prior service, or should be based on length of service

alone, expressed as a percentage of average salary earned. As a suggestion, such a benefit might be computed as one-seventieth of average salary for each year of prior service, plus one one-hundred-fortieth of average salary for each year of contributory service with a maximum limit on the period of service credited for this purpose, and the maximum amount of annuity to be granted. There should be no maximum imposed on the amount purchased by members' deposits.

It is evident that substantially increased contributions from some source will be necessary in order for the Retirement Fund to meet its future obligations. We believe that the major portion of such increased contributions should come from the employer, either the governmental sub-divisions or the state, or both. There can be no question of the benefit to the employer in having a sound retirement system for its employees. The ability to retire employees from service who are no longer able to perform their duties efficiently, and the satisfaction and encouragement of the employee who is assured an adequate retirement allowance, make for better and more efficient employees, greater continuity of service, and tends to attract persons of greater ability to such service. Public employees are not now covered by the Federal Social Security Act, which attempts to provide a measure of security in old age to anyone covered by its terms. The establishing of retirement systems for public employees has become such a general practice that it is regarded as an obligation for the public employer to make adequate provision for employee retirement. The principles underlying this System

are essentially for the good of public employers and employees within the state. Failure to provide adequate financing has jeopardized the continued operation of the System, and it is therefore a matter of vital concern that steps be taken immediately to correct this condition.

TEACHERS RETIREMENT FUND

The original Retirement Fund for teachers in the State of Minnesota exclusive of cities of the first class, was known as the Teachers Insurance and Retirement Fund, and was established under the provisions of Chapter 199 of the Minnesota Laws of 1915.

This act provided a definition of those who were eligible for membership, and stated that the purpose for which the Fund was organized was for better compensating teachers in the public schools, and make the occupation of "teacher" more attractive to qualified persons.

The sourdes of income for the Fund were as follows:

First - Members assessments in accordance with the following schedule.

For the first five years of teaching, $5 per year
For the second five years, $10 per year
For the next ten years, $20 per year
For the next five years, $30 per year

Such assessments were uniform for all members except that if the salary of the member was $1500 or more, assessments were based on the following scale: One and one-half per cent of salary, but not more than $20 per year for the first ten years of service, and two per cent, but not more than $40 for each successive year provided that in no case shall the assessment on this basis be less for any year than the rates in the preceding schedule, and that in no case should assessment be

continued for more than 25 years.

Second - From donations, gifts, legacies or bequests.

Third - From interest earnings on investments of the Fund.

Fourth - From a tax of one-twentieth of one mill on all the taxable property in that part of the state subject to the provisions of the act.

Members' assessments were paid in as many equal monthly amounts as there were months in the school year for which the teachers' salaries were paid, and were paid by salary deduction by the Board of Education or other managing bodies who were responsible for payment of teachers' salaries.

Credit was allowed for service for periods of employment prior to the taking effect of this law, but the member was required to pay arrearages for the period of service for which credit was allowed. In the event of retirement before the teacher had paid in fees a sum equal to the full amount required for the anuity applied for, and to which the teacher was entitled, any unpaid balance was deducted from the first year's annuity to such teacher.

The boards of education are charged with the duty of making the salary deductions and furnishing statements showing the amount of such deductions, and an annual record showing the service and salary deductions of each teacher during the past school year.

The management of the fund was vested in a Board of five trustees, consisting of the state superintendent of education,

the state auditor, the attorney general, and two members of the Association elected by the membership for terms of two years each. The Board was granted powers to make rules for the management of the Association to employ such clerical assistance as was necessary, to pass on all applications for benefits, and to invest the funds not needed for current purposes in the same class of securities as the school funds of the state were required to be invested. The Board was required to make an annual report of the conditions of the funds for the preceding year. The state treasurer was ex-officio the treasurer of the Retirement Fund.

Any person employed as a teacher under the definition in the act at the time of the taking effect of the act, was entitled to membership upon written application on or before September 1, 1917. Any person employed as a teacher after September 1, 1915 was required to become a member.

After twenty years or more of teaching service, at least fifteen of which must have been spent in the public schools of the state, and withdrawal from teaching service, such teacher was eligible for retirement on an annuity as follows:

After 20 years of service	$350
After 21 years of service	$380
After 22 years of service	$410
After 23 years of service	$440
After 24 years of service	$470
After 25 years of service	$500

Although the act is silent on this point, we assume that the $500 annuity represents the maximum allowed under the act. All annuities were payable quarterly.

In the event of disability, after at least 15 years of teaching service, ten of which shall have been in Minnesota, a teacher was entitled to a disability annuity bearing the same proportion to an annuity for 20 years of service as the term of service bore to 20 years.

Any teacher retiring, and again returning to teaching service was not entitled to receive the annuity during such period of teaching, but payments were resumed upon again retiring from teaching service.

In the event of withdrawal from service before entering upon an annuity or death, the member or his beneficiary was entitled to a refund of one-half the total amount contributed to the Fund by the member without interest. If such a teacher should subsequently return to teaching service, he was required to return the amount so withdrawn with interest at the rate of 5%. Such refund should be paid within one year from return to teaching service.

The Board of Trustees was granted the power to reduce the annuities provided in this act whenever, in their judgment, the condition of the Fund required such reduction. This act did not apply to any city of the first class.

The Teachers' Insurance and Retirement Fund established under this law operated until 1931. Due to the fact that the sources of revenue, provided for the maintenance of the Fund, were inadequate to provide the benefits promised, the Board found it necessary to reduce the annuities by fifty per

cent, including annuities already granted, and the rights to annuities for active members.

The 1931 legislature created the present Teachers' Retirement Fund, under the provisions of Chapter 406 of the Laws of 1931 and subsequent amendments thereto, which act is known as Chapter 135 of the Minnesota 1941 Statutes. A brief description of the provisions of this act is as follows:

A teacher is defined to include any person rendering service as a teacher, supervisor, principal, superintendent, or librarian in the public schools of the state outside the cities of the first class, in the state teachers' colleges, or in any charitable institution supported, in whole or in part, by public funds, or a person who is engaged in educational administration in connection with the state public school system, including state teachers' colleges, but excluding the state university.

The purpose of the Fund is declared as that of improving educational service, better compensating teachers, making more attractive the occupation of teaching, encouraging savings and rewarding faithful and continued service.

Sources of income were as follows:

(1) Payments made by teachers who become members of the Fund.

(2) Donations, gifts, legacies, and bequests.

(3) Interest earned on investments.

(4) The transfer of the assets of the Teachers' Insurande and Retirement Fund.

(5) Moneys contributed by the state.

The management of the Fund is vested in a board of five trustees, consiting of the commissioner of education, the state auditor, the commissioner of insurance, and two members of the Fund who are elected by the members of the Fund. The Board elects annually a president from among its members, and elects a secretary who shall serve during the pleasure of the board and be the executive officer of the Fund, and is authorized to employ such other employees as may be necessary to properly administer the Fund. One-half the cost of administration is paid by the Fund, and the balance by the state. The state treasurer is ex-officio treasurer of the Fund. He is authorized to receive and pay out money of the Fund on warrants issued by the state auditor on the authority of the Board. He is required to keep full account of the financial transactions and to make an annual report to the Board.

The Board has power to formulate such rules as are necessary for the administration and management of the Fund, to pass upon applications for membership, withdrawals or benefits, and is required to certify to the state board of investment such sums as shall not be needed for current expenses. The state board of investment invests the sums so certified in such securities as are authorized legal investments for savings banks and trust companies. The Board is required to keep a record of the receipts and disbursements of the fund and a separate account

with each member. It determines annually the net interest earnings by deducting the expenses of the Fund from the gross interest received. Five per cent of the net interest earnings is set aside annually as a contingency reserve until such contingent reserve equals five per cent of the total assets of the Fund. The remainder of the net annual interest earned is apportioned and credited to the separate accounts of the members. The Board is required to present an annual report of the conditions of the Fund at the annual meeting of the members of the Fund.

Membership in the Fund includes all teachers who render any teaching service after August 1, 1931 in any of the schools or institutions to which this act applies, except: (1) any teacher who has not attained the age of 25 years except upon written application for membership, and provided that such teacher shall automatically become a teacher upon reading the age of 25 years. Any such teacher can receive credit for service prior to attaining age 25 upon written application and payment of 5% of the annual salary received during such service with interest at 4%; (2) those who have rendered teaching service prior to August 1, 1931, except upon written application within two years after the first teaching service subsequent to August 1, 1931.

Each member is required to pay into the Fund 5% of salary but not in excess of $100 per year, which payments are credited to the individual account of the teacher.

The board of education, or similar managing body required by law to pay teachers salaries, is required to make the deduc-

tions from salaries for the teachers payments into the fund. Such board of education is required to forward to the county treasurer in January and June of each year the amounts of money retained in the preceding six months, and a statement showing the name of each teacher, the service rendered during the period for which the statement is made, and such other information as the board may require. The amounts so deducted from salary and the statements of employment and service are remitted semi-annually to the state treasurer and the board respectively.

As of December 31, 1951, all assets of the Teachers' Insurance and Retirement Fund were transferred to the Teachers' Retirement Fund, and the board was required to keep a separate account of the amount so transferred until final liquidation of the Teachers' Insurance and Retirement Fund.

Teachers who were members of the Insurance and Retirement Fund who did not become members of the Teachers' Retirement Fund were entitled to a withdrawal of the amounts theretofore paid into the Insurance and Retirement Fund provided application for such refund was filed not later than January 1, 1954.

Such a teacher had the right, in the event that the option to withdrawal was not exercised, to pay into the Teachers' Retirement Fund any additional sum, which together with the amount previously paid, shall not be in excess of 5% of the teacher's average salary for the five years of service immediately preceding, multiplied by the number of years of previous service for which the teacher has been given credit;

provided that if more than 15 years of such service had been rendered, there shall be assigned to the teacher's credit from state funds, as a part of such teacher's savings for each year of service beyond 15, five per cent of the total additional amount that such teacher has a right to pay, not however, exceeding the amount paid by the teacher under such right, and in no event more than 50% of such total additional amount. The amount so assigned from state funds shall reduce to the same extent the total amount which the teacher may pay in addition to the funds transferred. Any amount so transferred from state funds shall be used only in the purchase of an annuity and may not be withdrawn. Teachers drawing annuities were made members of the Teachers' Retirement Fund and were entitled to receive annuities equal to the annuity paid, or to which a teacher would be entitled under the provisions of Chapter 199, Laws of 1915 on the basis of prorating in effect on December 31, 1931.

Teachers who were members of the Teachers' Insurance and Retirement Fund were credited with the amounts as of January 31,1932 theretofore paid into the Insurance and Retirement Fund. The balance remaining in such Fund was apportioned to the accounts of members of the Teachers' Retirement Fund who were members of the Insurance and Retirement Fund on the basis of amounts which they had contributed, provided that not more than 4% compound interest was credited to active members. Any amount remaining was apportioned to the accounts of annuitants to be used in the payment of annuities. Any further amounts required to pay the annuities of such annuitants was made an obligation

of the state.

Teachers who were not members of the Insurance and Retirement Fund, but who rendered teaching service prior to August 1, 1931, and who became members of the Teachers' Retirement Fund were entitled to pay into the Fund such amounts as the teachers would have paid as assessments under the provisions of Chapter 199, Laws of 1915, with interest at 6%, and receive credit for such teaching service; and in addition such amounts as the teacher may elect to pay subject to the limitation that the total amount should not exceed 5% of such teacher's average salary over the five years immediately preceding the school year 1931-1932 and not more than $100 per year, multiplied by the number of years of such service. If more than 15 years of such prior service had been rendered, the teacher was credited from state funds for each year of service beyond 15, 5% of the total additional amount that such teacher had a right to pay not exceeding the amount paid by such teacher under such right, and in no event more than 50% of such total additional amount. The amount assigned from state funds reduced to the extent thereof the total amount which the teacher might pay. Any amount so contributed by the state shall be used only to purchase an annuity, and is not subject to withdrawal.

Teachers from other states or from schools in the state to which the provisions of this act do not apply, after becoming members of the Teachers' Retirement Fund and receive credit for 15 years of teaching service, have the right to pay into the fund an amount equal to 5% of the average annual salary not in

excess of $2,000 received during the five years immediately before making such payments, multiplied by the number of years of previous teaching service for which credit is given together with interest at 4%.

When any teacher who is a member of the fund shall cease to render teaching service in any school to which this act applies, the entire amount to the credit of the teacher as teaching service shall upon written application be paid such teacher in cash. In the event of death, such amount shall be payable to the designated beneficiary of the member.

A teacher who has ceased teaching service with 30 years or more of teaching service credited, or has attained the age of 55 years, may use the money credited as teachers' savings (1) to purchase from the fund a life annuity in such amount as the rates established by the board will provide, or (2) to purchase an annuity for a term of 15, 20 or 25 years in such amount as the rates established by the board will provide.

Upon the election by the teacher to purchase such a life or term annuity, the state shall pay to such teacher a similar annuity of equal amount provided that if a term annuity is elected, payments by the state shall not continue after the death of such teacher, and further provided, that the amount of annuity paid by the state shall not exceed in amount the annuity which such annuitant could purchase with the money credited as teachers' savings for the first 35 years of teaching service.

Upon total and permanent disability after 15 years of teaching service, a member may withdraw the amount credited as

teachers' savings or may use such amount to purchase a life or term annuity. If an annuity is elected, an annuity of equal amount is paid from state funds, except that in the case of term annuity, payments from the state shall not continue after the death of the teacher. The board has the right to require that any teacher retiring shall submit to a physical examination annually in order to determine the continuance of disability and right to further benefits. Upon recovery from disability, the amount of benefits paid from teachers' savings shall be charged against the amount credited to the account of the teacher as teachers' savings. All annuities are payable quarterly on the first days of January, April, July and October.

No teacher shall have the right to assign any rights or benefits, or amounts credited as teachers' savings, under the provisions of this act. The teacher shall have the right to change his designated beneficiary, and in the event of death of the beneficiary without a new designation, the estate of the teacher shall be the beneficiary.

The board shall determine the amount of money necessary to meet the state's obligation as provided in this act, and shall certify the amount so determined to the state auditor. The board shall certify separately the amounts required to pay annuities to annuitants whose service was rendered for the state at large, together with the amount necessary to meet the state's share of operating cost and the amount required to pay annuities to annuitants whose teaching service was rendered for schools and institutions located outside the cities of the first class.

In case any annuitant has rendered teaching service in part for the state at large, and in part for schools and institutions outside the cities of the first class, the amount certified shall be prorated on the basis of the respective amounts contributed by such annuitant to teachers' savings while rendering such service.

The auditor is directed to include in the state tax levy the amount so certified and not included in any previous levy, provided that the levy against the taxable property outside the cities of the first class shall not in any year exceed the sum of $250,000.

The auditor, upon receiving such certificates from the board, is authorized to issue and sell certificates of indebtedness in anticipation of the taxes levied under this act with such rate of interest as he shall determine, but not in excess of 5% per annum. The principal and interest of such certificates shall be paid from the proceeds of tax levies made as provided in this act.

This act does not apply to any cities of the first class in the State of Minnesota, except as the act applies to the state school system.

Chapter 146 of the Laws of 1931 made all county superintendents of schools eligible for membership in the Teachers' Insurance and Retirement Fund upon written application, and are thereafter subject to the provisions of Chapter 199 of the Laws of 1915.

In making this study we have attempted to investigate the applicable provisions of the law and in the light of such provisions, and the experience of the Retirement Fund, to investigate the present status of the Fund, to measure its adequacy, and to predict what may reasonably be expected in the future. In order to accomplish these aims, the secretary of the Retirement Fund furnished detailed information with reference to all members of the Retirement Fund, both active and retired, in the forms in which this information was requested.

The data obtained was compiled as of June 30, 1943, and our comments as to present status of the Fund relate to that date.

Punch cards were prepared from the information so submitted, various tabulations were made, and exhaustive statistical studies of these tabulations were carried out. Results of such studies and our comments thereon follow.

MEMBERSHIP

The tabulation of the membership of the Retirement Fund shows a total of 8,978 members of which 8,046 were active, and 932 retired. A distribution of the active membership by age and sex, and of the retired members by age, sex, and annual amount of annuity payable is as follows:

ACTIVE MEMBERS

Age	Men	Women	Total
22 & Under	9	75	84
23-27	289	1,319	1,608
28-32	774	2,301	3,075
33-37	578	760	1,338
38-42	270	450	720
43-47	153	318	471
48-52	112	186	298
53-57	59	136	195
58-62	31	136	167
63-67	19	52	71
68-72	2	14	16
73-77	1	2	3
Total	2,297	5,749	8,046

RETIRED MEMBERS

Age	Men		Women		Total	
	No.	Amt.	No.	Amt.	No.	Amt.
43-47			2	1,275	2	1,275
48-52			3	508	3	508
53-57	7	2,508	24	5,897	31	8,405
58-62	29	10,334	122	40,367	151	50,701
63-67	37	13,979	246	98,271	283	112,250
68-72	40	19,340	180	82,129	220	101,469
73-77	35	19,419	113	50,915	148	70,334
78-82	15	12,801	51	18,287	66	31,088
83-87	7	2,524	16	6,639	23	9,163
88-92	2	1,212	3	1,027	5	2,239
Total	172	$82,117	760	$305,315	932	$387,432

The experience of the Retirement Fund indicates a very substantial turn-over in membership which is further evidenced by a study of the distribution of membership by length of service. Of the 2,297 active men, 571 or about 25%, have less than 5 years service; 1,456 or more than 60%, have less than 10 years service. Only 241 or less than 10%, have 20 years or more of service. Among the women, 1,292, or more than 20%, have less than 5 years of service, and 3,774, approximately 2/3 of the total, have less than 10 years of service. 896, or slightly less than 1/6 of the total, have 20 or more years of service.

FINANCIAL STATUS

A study of the balance sheet of the Retirement Fund at June 30, 1943 shows total assets of $4,663,068.12, consisting principally of investments in bonds, cash deposited with the state treasurer and amounts due from the state of Minnesota. Liabilities of the Fund were for assessments receivable $168,253, teachers' savings accounts, totaling $3,129,275, annuity reserves of $1,054,367, and the reserve for contingencies as required by the 1931 Law of $55,275, and an undistributed surplus amounting to $247,888 to balance the total assets.

Income of the Fund for the fiscal year ended June 30, 1943 was $871,856 from the following sources; from members, $455,122; interest on investments $151,863; and from the state of Minnesota, $264,871. Expenditures over the same period were $692,020 distributed as follows; withdrawals of members'

savings $271,191; annuities paid, $385,841; premiums and accrued interest on bonds, $20,845; and administrative expenses, $14,143. The Fund has shown continuous growth since established on its present basis by the 1931 Law.

PRESENT STATUS OF FUND

In order to measure the adequacy of the Retirement Fund as now constituted, the assets held must be measured against the liabilities as determined by the provisions of the governing statute.

It is immediately obvious that the provisions for financing the 1915 Law were inadequate. A teacher after 20 years of service, and contributions totaling $275 over this period, was entitled to an annuity for life of $350 annually regardless of age or sex at the time of retirement. The rates now in effect for granting annuities from the Teachers' Retirement Fund would require an amount of $3,320 to provide such an annuity for a man at age 65, or more than 12 times the amount of the member's contributions during the period of service. Similar comparisons at other ages and periods of service for both men and women would also demonstrate most conclusively the inadequacy of the provisions for contributions. This inadequacy so depleted the funds of the Teachers' Insurance and Retirement Fund that the board reduced the annuities to be granted by 50%. Even with this reduction, the provisions for financing the plan were inadequate, and the benefits provided were so small as to render the System ineffective for the purpose of superannuation of teachers.

Fortunately, the 1931 Law recognizes that any deficiency in the contributions made under the old law are liabilities of the state, and any amounts required in addition to the funds available for payment of such annuities, are to be paid from state funds.

The 1931 Law provides for contributions by teachers on a basis of 5% of salary but not to exceed $100 per year. These contributions are accumulated throughout the period of service, and are applied at retirement to purchase annuities on the basis of rates as established by the Retirement Board. Such annuities are matched by additional and equivalent annuities paid by the state. Members are also permitted to make additional contributions for periods of prior service before becoming members of the Association, which in effect, produce the same result as if such contributions had been made during the entire period of service. The state annuity similarly recognizes prior service. Annuities granted under the 1931 Law on account of teachers' savings, therefore, are based upon the amount actually on hand accumulated to the credit of the retiring teacher, and are adequate to provide the benefit on the condition that the rates established by the board are adequate for such purposes. The amount of liability which should be fully funded, therefore, is the present value of future payments of the amount of annuities granted from teachers' savings under the 1931 Law. We have made a computation of this liability on a mortality and interest assumption which we believe to be reasonable and relatively certain of fulfillment. The basis

which we have used in valuing this liability is the Combined Annuitants Mortality Table, and interest at 13% per annum. The Combined Annuitants Table conforms generally to the mortality experience of retired employees under retirement systems or to persons who have purchased annuities from life insurance companies and is, we believe, a reasonable measure of the mortality experience which may be expected among the retired members of the Association. The interest rate of 4%, while somewhat optimistic and probably impossible of fulfillment under present day conditions of investment, is probably a reasonable assumption over a long period of years.

In making the valuation of the liability for future payments of annuities already granted, we have valued all annuities, whether granted under the old or the new law, and whether arising from teachers' savings or the matching annuities granted by the state. For the 932 annuities in effect, with a total annual amount of $387,432, our computation shows a present value of future payments amounting to $3,731,637. This represents the sum that the Fund should have on hand in order to make all future payments under these annuities as they fall due. The amount which the Fund should have on hand is the present value of annuities granted from teachers' savings since there are no sources provided for additional revenues to make up any deficiency in the amounts for payment of such annuities. According to our computations, this liability totals $1,187,990. The annuity reserves held by the Retirement Fund, excluding $29,292 annuity reserves under the 1915 Law, amount to $1,025,065,

or $162,915 less than the liability as computed. The balance of the liabilities, or some $2,543,000, represents the state's liability.

Since payment of annuities granted by the state, or for which the state is liable, are made currently and no attempt has been made to provide funds in advance to liquidate this liability, there is no necessity for the Fund to establish a liability for the state's contribution so long as the requirements from the state are made in full.

The deficiency in the required reserve is brought about by the fact that the rates, established by the board for granting annuities from teachers' savings, are too liberal on the basis of present conditions of mortality and interest.

We have made a projection of the present membership of the Fund, assuming mortality according to the Combined Annuitants Table of Mortality and rates of withdrawal, estimating the expense of the Association in order to approximate the probable demand upon the Fund for annuity payments in future years. It must be understood that these projections represent only the results which would be obtained if the basic assumptions were met exactly and uniformly from year to year in the future. This cannot be expected to happen as there are many factors which influence mortality, withdrawal, and retirement; the source of which can not be predicted and which may affect the result to some extent. These projections should rather be taken as the prediction of the general course of annuity payments,

and within reasonable limits, the amounts which the Fund may be expected to pay in annuity payments. These projections do not take into account any new entrants into the Fund, but relate only to the present membership. New entrants would not materially affect the results for 20 to 25 years, and we have, therefore, excluded them. The results of these projections show a very gradual increase in annuity payments over the next 15-year period, with a slightly accelerated increase up to about the 25th year, at which time we estimate annuities in effect with annual payments of about $445,000.

CONCLUSIONS

We conclude from our study of the Teachers' Retirement Fund, and its predecessor the Teachers' Insurance and Retirement Fund, that the original fund was inadequate in its provisions for contributions, and likewise, inadequate in its benefits provided from the standpoint of providing at least a minimum standard of security for retired teachers. The results of these inadequacies are well-known and need no further discussion.

The complete revision of the Retirement Plan and the establishing of the Teachers' Retirement Fund in 1931, and the assumption by the state of the responsibilities for annuities granted under the 1915 Law, went a long way toward correcting the deficiency and inadequacy of the System as it has existed previously.

The provisions of the act with reference to membership and service credit, and the rights of members to acquire additional service credit by additional contribution, appear to be sound and reasonably adequate. The rate of contribution to the fund by members is sufficient to produce a reasonable annuity from this source when matched by the state. The maximum limitation on contributions by members could well be eliminated in order to permit members with salaries greater than $2,000 per year to contribute the required percentage of the full salary, or to permit members to deposit voluntarily additional sums for the purpose of increasing the annuity available at retirement. The provision for contribution by the state is adequate so long as the state makes such contributions promptly and in full when due. There are two principal objections to such a method of financing; (1) the burden on the taxpayer might eventually be too great, or for some reason the amounts required currently for annuity payments might not be raised; (2) future legislatures might repeal the section of the law relating to state contributions or refuse to make the necessary appropriation, in which case, no funds would be available for the payment of annuities from state sources which have already been granted, or for any which may be granted in the future. Contribution by the state currently with service of amounts sufficient to produce the entire amount necessary at retirement for the purchase of annuities, would eliminate the second of these objections almost entirely, and would have the further benefit of making the cost to the taxpayer as low as possible

since the fund would have the benefit of the accumulation of interest on such amounts deposited throughout the period of service.

There is no provision in the law requiring a periodical valuation of the liabilities of the fund for the purpose of determining the adequacy of the fund in general, and of the rates established by the board for granting annuities. It is highly important that this should be done, preferably on an annual basis in order that the board may be continually aware of the status of the fund. Such valuations made by a competent actuary would immediately reveal any inadequacy in the funds of the Association, or the annuity rates provided, and would enable corrective measures to be taken before the situation became acute.

In general the System seems to be established on a reasonably adequate basis with two exceptions; first, the provisions of contribution by the state should be revised to provide for contributions currently with service for active members sufficient to provide their annuities at retirement, and additional amounts to liquidate the current and contingent liabilities of the state for which no funds are accumulated; second, the rates at which annuities are granted appear to be too liberal in the light of current conditions of interest and mortality and should be revised on the advice of a competent actuary. Annual valuations should be made to determine the actuarial solvency of the fund.

HIGHWAY PATROLMENS' RETIREMENT FUND

The Highway Patrolmens' Retirement Fund was established under the provisions of Chapter 637, Laws of 1943. Until the effective date of this act, the highway patrolmen were under the provisions of the State Employees Retirement Fund.

This act established a retirement fund for highway patrolmen who are employed by the State of Minnesota and provides that all patrolmen employed at the effective date of the act, and who are thereafter employed shall become members.

Each member contributes 6% of salary, not to exceed the sum of $15 per month, which shall be deducted by the commissioner of highways, and remitted to the state treasurer together with a report of all monthly deductions.

An equal sum is paid out of highway funds into the Retirement Fund each month. All such deposits received by the state treasurer shall be deposited in the Highway Patrolmens' Retire- Fund and all expenses and benefits provided by the act are to be paid from this fund.

The amount of contribution required from patrolmen may be increased from time to time to insure the actuarial soundness of the fund.

The officers of the Association are the chief of the State Highway Patrol who is ex-officio the president, the state treasurer who is ex-officio treasurer, and the secretary elected from the membership of the Association for a term of two years. These officers are empowered to administer the

provisions of the act and to make such rules and regulations as may be necessary for such purpose.

The secretary of the Association keeps all records of membership, salary deductions, and such other records as may be necessary.

The state board of investment is authorized to invest the funds of the Association in such securities as are duly authorized investments for savings banks or trust companies.

Sixty-six per cent of the deposits made by highway patrolmen into the State Employees Retirement Fund was transferred from such fund into the Highway Patrol Retirement Fund. The commissioner of insurance is required to make a biannual audit of the fund and report to the legislature on its condition on an actuarial basis.

Any patrolman who has been in the employ of the state for 20 years or more and during which time shall have paid into the State Employees' Retirement Fund or the Highway Patrolmens' Retirement Fund the amounts required by law, and who shall have attained the age of 58 years, is entitled to a life annuity upon separation from state service amounting to 60% of the average salary received during the 5 years immediately prior to such separation to be paid in monthly installments during his lifetime, subject to the limitation that no annuity shall be in excess of $100 per month. Any patrolman who has been employed for more than 15 years, but less than 20 years, when he attains the age of 58 years may, if physically qualified,

continue service as a patrolman until he has attained the age of 60 years or he may upon attaining age 58 or 60 pay into the fund the amount which he would be required to deposit to complete 20 years of service and be entitled to the full life annuity herein provided.

Any patrolman who upon attaining age 58 has served more than 10 years, but less than 15 years, shall be entitled to that proportion of the full life annuity which the years of service in the Highway Patrol bears to 20 years.

In the event of death, the total amount contributed less the annuity payments received, if any, shall be paid to the surviving spouse, if any, and otherwise to the heirs of the member.

Any patrolman less than 58 years of age who has been employed for at least 10 years and who shall become disabled as a result of an injury or other disability incurred in line of duty, shall receive a disability benefit during the period of such disability equal to 60% of his salary at the time such disability occurs, but not to exceed $100 per month. In the event of death of a patrolman receiving a disability benefit, the amount he has paid into the fund, less the amount of disability benefits received, shall be paid as a death benefit. Provisions for disability are subject to the exception that any payments made under the Workmens' Compensation Act or income from any employment, shall be deducted from the disability benefits. No such benefit shall be approved except upon adequate

proof of the existance of such disability, and the Association shall have the right to require the disabled patrolman to submit proof of the continuance of such disability.

Upon withdrawal from service prior to age 58, and with less than 20 years of service, the patrolman shall be entitled to a refund of all payments made into the fund.

The provisions of the act transferring 66% of the amounts paid into the State Employees Retirement Fund specified this percentage because of the fact that the financial statement of the State Employees Retirement Fund at the time of passage of the act showed that the assets represented approximately 66% of the total amount of members' deposits. The balance of 34% of said deposits are maintained as credits to the account of the patrolmen in the State Employees Retirement Fund.

We were furnished a list of the members of the Highway Patrol Retirement Association as of November 15, 1944, showing the date of birth, date of entry into service, present salary, years of service, the amount transferred from the State Employees' Retirement Association, the balance retained in the State Employees' Retirement Fund, and the salary deductions which had been credited.

The membership of the Association is classified in four groups; (1) permanent active employees, (2) permanent employees on military leave, (3) temporary active employees, (4) temporary employees on military leave. The number of persons involved in each of these classifications is as follows:

Permanent active employees	79
Permanent employees on military leave	73
Temporary active employees	6
Temporary employees on military leave	14
Total	172

One member has died and his deposit of $378 has been paid as a death benefit. One member has withdrawn from service and has withdrawn his deposit of $721.48.

The act provides that any patrolman reaching 58 who has at least 20 years of service is entitled to an annuity of 60% of salary, not to exceed $100 per month, that each member contributes 6% of salary not in excess of $15 per month, and that a matching contribution is made by the Highway Department.

In order to test the adequacy of the contributions we have projected each individual's account, including the balance transferred from the State Employees' Retirement Association, up to age 58 accumulating the salary deductions and Highway Department credits at an assumed rate of interest of 3% until the date when he would reach age 58. The accumulation thus obtained was applied to purchase an annuity on the assumption that annuities would be based upon the Combined Annuitants Table of Mortality with interest at 3%, which we believe is a reasonable basis for determining such benefits. In every case but three, the years of service upon attaining age 58 would equal or exceed 20 years with the average for permanent employees about 30 years. On the assumption that there were no deaths or withdrawals, the accumulations so computed would purchase 54.6% of the proposed annuity. Making reasonable

allowance for withdrawals and for deaths according to the Combined Annuitants Table of Mortality, the accumulations would purchase 63.4% of the proposed benefits.

The reason for the deficiency with regard to present active members if the fact that full deposits have not been made from the Highway Fund or from any other state source for the years of service prior to the effective date of the act.

In order to determine the adequacy of the contribution rates with respect to the benefits for a new employee, we have made an accumulation with the same assumptions as before assuming that the patrolman entered service at age 28 and remained in service for 30 years, retiring at age 58 with an average salary of $180 monthly. The accumulation thus computed would be fully adequate to provide the proposed retirement benefit and in our opinion an additional amount sufficient to provide for disability benefits.

It would appear therefore, that with respect to future entrants into the System, the provisions for contribution will be adequate to provide the benefits on the assumption that the mortality and interest basis assumed will be an accurate measure of the experience of the Association.

With respect to present members, some provision will have to be made for additional contributions with respect to prior service in order for the fund to be fully adequate to provide the benefits. Such additional contribution could be provided from highway funds, or jointly from highway funds and

by the members, taking into consideration the amounts paid into the State Employees Retirement Fund before the passage of the act.

The greatest danger of failure of the fund to carry out its provisions lies in the fact that the number involved is so small that there is a probability of very wide deviation from the mortality and interest assumptions. Any calculations based on a mortality table assume that there are sufficient numbers involved so that the law of averages may be expected to operate. Furthermore, the amount of the fund will necessarily be comparatively small, which may restrict the opportunities for investment and result in an interest yield on investments less than should be reasonably expected.

The plan is simple and easily understood and except for the small number involved may be considered reasonably satisfactory. Generally speaking, a retirement age as low as 58 and service requirement as low as 20 years would not be regarded as satisfactory, but due to the special nature of the employment, the early retirement age may be assumed to be necessary.

The requirement for only 20 years of service before becoming eligible for the full retirement annuity is perhaps too liberal a provision as contributions for the minimum period would fall considerably short of being sufficient to provide the benefits.

There is no provision in the act, except for raising

the contributions by members, for taking care of any deficiency in the plan. The provision for increased contributions is a suitable provision which could be applied to members who would be expected to serve for less than 30 years, and the increase could be applied on a graduated scale depending upon the number of years of anticipated future service. There should be some provision, however, for additional deposits by the employer, or jointly by the employer and the member, to make up deficiencies as to prior service.

The small number of persons involved raises a serious question as to the soundness of the plan, and it may be advisable to discontinue this fund as a separate unit, and to combine it with the State Employees' Retirement Fund as a special class with special provisions for contribution in order to meet the benefit of the much wider spread over the entire group of state employees.

In general it appears that the Public Employees' Retirement Fund, as presently constituted, is wholly inadequate to provide the promised benefits. With regard to this fund, we believe it imperative that action be taken not later than the 1947 session of the legislature, making adequate provision for additional contributions sufficient to set up the fund on an adequate basis. We believe that this can be accomplished by providing an increase in the rate of contribution by members to 5% of salary, and a provision for contribution by the governmental sub-divisions involved in an amount sufficient to provide all benefits not provided by members' deposits.

We believe that the provision for granting benefits should be revised in accordance with our suggestion on page 26 of the report covering this fund as we believe this will provide more equitable benefits for all retiring members.

We further recommend consideration of the removal of any present limitation which now excludes any governmental unit from membership, and that the plan be made compulsory upon all such governmental units. If this were done, the provisions for contributions by the employer could possibly be handled by a state-wide levy rather than individual levies in each of the governmental units.

The Teachers' Retirement Fund, as now constituted, appears to be reasonably adequate except for the fact that the rates at which benefits are granted are too liberal in view of the experience of the Association. These rates should

be revised with the advice of an actuary to reflect more accurately the experience which may reasonably be expected in the future.

One serious deficiency in the provisions of the governing act is the lack of any provision for making up deficiencies in the operation of the fund. We recommend that a provision be added making such deficiencies an obligation of the state and that payments covering such deficiencies shall be made when certified by the board of trustees after such deficiencies have been ascertained.

The Highway Patrolmens' Retirement Fund should, theoretically, be able to carry out the provisions of the governing act with the addition of the changes suggested. As a practical matter, however, we believe that the number involved is much too small for practical operation and that it would be advisable to discontinue the fund as now constituted and make it a part of the State Employees' Retirement Fund, with the group set apart as a special class with special provisions and special rates of contribution if found advisable.

In concluding, I wish to extend my thanks to Mr. Dix and Mr. Ousdigian of the Public Employees' Retirement Fund, Miss Daisy Brown of the Teachers' Retirement Fund, and Mr. Earl M. Larimer of the Highway Patrolmens' Retirement Fund for their thorough cooperation and assistance, and the many helpful suggestions made during the progress of this investigation.

Respectfully submitted,

Edward D. Brown, Jr., Actuary